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M16C PC4701 Emulator Debugger V.1.02.00
Release Notes

This document describes the notes of this debugger, and please read before you start to use this debugger.

And also, please refer to the "High-performance Embedded Workshop Release Notes" about the notes of High-performance Embedded Workshop IDE.

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1 Notes

1.1 Line Assembly

Regardless of the Radix setting, the default for line assembly input is decimal. Specify H as the radix for a hexadecimal input.

1.2 Event Setting

1. TAB order in Set Event Status dialog box
   Even when you press [TAB] key, the next input control may not be focused on the Set Event Status dialog boxes opened from H/W Break, Time Measurement, and Trace Point.
2. In-place-edit mode on event list
   On event list in H/W Break, Time measurement and Trace Point, High-performance Embedded Workshop will not escape from in-place-edit mode even when you press the [ESC] key.
3. Event setting by BIT SYMBOL
   When the specified address is odd numbers, the setting by BIT SYMBOL can not set the correct condition. Use DATA ACCESS setting and specify the compared data with the data mask. For details about how to set the conditions for odd number addresses, refer to the online help.
4. Event detection for BIT SYMBOL
   When the event is set to detect the access to specified bit, it will be detected even if the other bit of the same address as the specified bit is accessed. This is because the access to the bit from MCU is byte access.

1.3 Data Trace

1. Split-bar behavior when double-clicking
   If you double-click the split-bar, which divides view up and down, the horizontal scroll-bar, vertical scroll-bar, and tabs in the upper view will vanish. Drag the split-bar to display them again.

1.4 Trace

1. Specifying function in SRC mode
   In the SRC mode, when you specify a function to display it, if the current displayed source file includes the function, the top of the source file will be displayed.
2. Saving of tracing result in text
   When you save a tracing result in text with only “BUS” and “DATA” buttons ON, the vertical position of some headers will shifts from the corresponding data. Check “Tab Separated Format” and open it with spreadsheet applications to display them correctly.
3. Loading the trace image file
   Trace window can not load the trace image file saved by PDxx debuggers. And also, trace window can not load the trace image file saved by the different target from the current target.

1.5 RAM Monitor

1. Proportional Fonts
   When a proportional font is selected, a part of the characters in the view may be hidden. Fixed fonts are recommended.

1.6 Memory

1. 8 bytes data operations
   To set, fill, and copy 8 bytes data are not supported.

1.7 Script

1. Result of interactive command
   When you invoke an interactive command, for example, Assemble and setMemoryByte, the running dialog box will appear and may hide the view of the results.
2. SCOPE Command
   When you refer current scope name with SCOPE command after program execution, the scope of the start-up module will be returned even if scope has been changed to the other.

1.8 Real-time OS debugging functions

1. When you use the feature to issue system-calls by the script command (MR SYS), the target program should be built with a specific option. For details, refer to the topic “Prepare the real-time OS debug” in the online help.

2. When you use the task pause function, the following code should be inserted to the configuration file of your target program. For details, refer to the user’s manual of the real-time OS.

```
// System Definition
system {
      :
    task_pause = yes; // Insert this line
};
```

3. The task pause function uses the address match interrupt of the target MCU. When the target program uses the address match interrupt, the task pause function can not be used.

4. The script command “MR STK, BASE” assigns one coverage area so that the area includes the top address of the system stack area. When you need to check the coverage of other areas, don’t use the “MR STK, BASE” command and use the “CoVerage BASE” command to assign coverage area instead. The system stack area and each task stack area will be displayed by the script command “MR STK, SYS” and “MR STK, TASK”.

1.9 Macro recording function

The debug windows which support the macro recording function are memory, registers, and IO. And also, the debug operations which support this are Reset CPU, Go, Reset Go, Go To Cursor, Step In, Step Over, Step Out, Add/Delete a break point, and Download the target program.

1.10 Test facility function

The contents to be compared by the test facility functions are memory, registers, I/O, Output, and stack trace window.

1.11 Using cast operators for the member variable

When you use cast operators for the member variable to refer to it as the pointer of the structure, you would not refer to it correctly.

1.12 Download module dialog box

This debugger does not support the setting of "Offset", "Memory verify on download", and "Access Size" in the download module setting dialog box. These are always treated as "Offset: 0", "Memory verify: off", and "Access Size: 1".

1.13 Real-time execution of the target program

If the following operations are invoked while the target program is running, the real-time execution capability will be lost.

- Dump memory
  - update the display of Memory Window
  - update the display of ASM Watch Window or C Watch Window
  - update the display of Source Window (DIS or MIX mode)
  - display the value of variables in Source Window
- Clear access history in RAM Monitor Window
- Change the ram monitor area in RAM Monitor Window
- Add or remove software break points
- Change the status of hardware break points
- Get the trace information forcibly or re-start recording the trace information in Trace Window

1.14 Notes on Debugging (M16C PC4701 Emulator Debugger)

1.14.1 Variables assigned to registers

When you build a target program, IAR EWM16C may generate the warning like following:

```
Warning [w23]: Cannot represent location of Register pair variable
'R1H:R1L'
```

In this case, you can not see the variable, which is assigned to R1 in the emulator software. IAR will fix it by upgrading XLINK in near future. Please ask IAR about it for more details.

1.14.2 In the case of using PC4701M with IAR's cross tools

When you have all the following conditions at once, the IAR's cross tools may not work correctly.

- Using the PC4701M in ECP mode of LPT connection
- The M16C PC4701 emulator software running

1.14.3 About the self-check function

In using the self-check function, if you connect the PC4701 emulator with PC via LAN interface, the self-check may fail to diagnose the emulator. When you use the self-check function, please use another communication interface except LAN interface.

1.14.4 About LAN communication with emulators by Windows Me, Windows 98 Windows XP or Windows2000

It is necessary for LAN communication with emulators by Windows 2000, Windows Me or Windows 98 to set the following registry.

1. When using Windows Me or Windows 98

Key	Value
HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\VxD\MSTCP\SackOpts	0 (REG_SZ)

2. When using Windows XP or Windows 2000

Key	Value
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters\SackOpts	0 (REG_DWORD)

You can set this registry by executing the registry setup program, "Sack.exe". And you can clear the registry with running the program "UnSack.exe".

- Sack.exe", the program setting the registry.
- Unsack.exe", the program clearing the registry.

The above programs are installed under the directory "\Utility" in the directory where the emulator software is installed.
(Ex. C:\ Renesas\HEW\Tools\Renesas\DebugComp\Platform\PDTarget)
When using Windows XP/2000, make sure Sack.exe and UnSack.exe are executed by a user who has Administrator rights. Users without Administrator rights cannot set the registry.

Supplementary:
Windows Me/98/CP/2000 TCP supports "Selective Acknowledgments (SACK)" as documented in RFC 2018. SACK gives higher performance in the network which have high bandwidth and long round-trip delays like satellite channels. SACK support is enabled by default in Windows Me/98/CP/2000. It is necessary for LAN communication with emulators by Windows Me/98/CP/2000 to disable SACK support. Setting the above registry can disable SACK support.
Note that when you use the network which have high bandwidth and long round-trip delays like satellite channels, the performance with SACK support disabled is lower than with enabled.

1.14.5 The file format selection of the object module file

When the specified file format in the debug setting dialog box is different from the format of the object module file, downloading the file may cause a freeze of the debugger. Please select the correct object format.

2 System Requirements

2.1 M16C PC4701 Emulator Debugger

Target host PC	
PC	IBM PC/AT compatible with Pentium III 600MHz or higher
OS	Windows XP Windows 2000 Windows Me Windows 98 Second Edition
Memory	128MB (ten times the size of the target load module file recommended)
HDD	Hard disk available capacity for installation: 100MB or more. Prepare an area at least double the memory capacity (four-times or more recommended) as the swap area.
Display Resolution	1024 x 768 or higher recommended

Emulator			
PC4701U	PC4701M	PC4701HS	PC4700H

Emulation Pod for M16C/60 Series	MCU file
M30600T-RPD-E	M30600.MCU
M30600T-RPD-E remodeled for M16C/61	M3060061.MCU
M30600T-RPD-E remodeled for M16C/62	M3060062.MCU
M30610T-RPD-E	M30610.MCU
M30610T-RPD-E remodeled for M16C/62	M3061062.MCU
M30620T-RPD-E	M30620T.MCU
M30620TB-RPD-E	M30620TB.MCU
M30620T2-RPD-E	M30620T2.MCU
M30620TL-RPD-E	M30620TL.MCU
M306H0T-RPD-E	M306H0.MCU
M306H1T-RPD-E	M306H1.MCU
M306H2T-RPD-E	M306H2.MCU
M306H3T3-RPD-E	M306H3T3.MCU
M306H5T3-RPD-E	M306H5T3.MCU
M306K5T-RPD-E	M306K5.MCU
M306N0TB-RPD-E	M306N0TB.MCU
M306N0T2-RPD-E	M306N0T2.MCU
M306NAT2-RPD-E	M306NA.MCU
M306NKT3-RPD-E	M306NKT3.MCU
M306V0T-RPD-E	M306V0.MCU
M306V2T-RPD-E	M306V2.MCU
M306V3T-RPD-E	M306V3.MCU
M306V7T-RPD-E	M306V7.MCU
M3062PT3-RPD-E	M3062PT3.MCU
M3062NT3-RPD-E	M3062NT3.MCU
M306N4T3-RPD-E	M306N4T3.MCU

Emulation Pod for M16C/20 Series	MCU file
M30200T-RPD-E + M30201T-PRB	M30201.MCU
M30200T-RPD-E + M30218T-PRB	M30218.MCU
M30200T-RPD-E + M30220T-PRB (M30220TF-PRB)	M30220.MCU
M30240T-RPD-E	M30240.MCU
M30245T-RPD-E	M30245.MCU
M30200T-RPD-E + M302N2T-PRB	M302N2.MCU
M30245T3-RPD-E	M30245T3.MCU

Emulation Pod for M16C/10 Series	MCU file
M30100T-RPD-E + M30100T-PRB	M30100.MCU
M30100T3-RPD-E + M30100T-PRB	M30100T3.MCU
M30100T-RPD-E + M301N2T-PRB	M301N2.MCU
M30100T3-RPD-E + M301N2T-PRB	M301N2T3.MCU

3 Version Report

This section describes the specification of the changed software.

3.1 M16C PC4701 Emulator Debugger V.1.02.00

In this version, the following specifications were changed from the previous version M16C PC4701 Emulator Debugger V.1.01.00.

This version supports all of the function extensions and the revisions to the restrictions in the High-performance Embedded Workshop V.4.01.00 and V.4.01.01. For more details, please refer to RENESAS TOOL NEWS "060701/tn1" issued on July 1, 2006 and "060801/tn1" issued on August 1, 2006.

3.1.1 Revisions to Restrictions

1. A limitation has been corrected: The structure member variables, union member variables, or class member variables whose name begins with a letter of 'e' or 'E' immediately followed by a numeral, are not referenced.
   For more details, refer to the RENESAS TOOL NEWS RSO-M3T-PD32RM-060116D issued on January 16, 2006.

3.1.2 Functional Extensions and Modifications

1. The real-time OS, M3T-MR30/4 which is compliant to µITRON 4.0 specifications, has been supported.
2. The ELF/DWARF2 format files generated using KPIT GNUM16C have been supported.
3. These commands, which can be invoked in Command Line, have been supported:
   breakpoint, breakpoint_disable, breakpoint_display, breakpoint_clear
   register_display, register_set
   disassemble, assemble

3.2 M16C PC4701 Emulator Debugger V.1.01.00

In this version, the following specifications were changed from the previous version M16C PC4701 Emulator Debugger V.1.00.01.

This version supports all of the function extensions and the revisions to the restrictions in the High-performance Embedded Workshop V.4.00.02. For more details, please refer to RENESAS TOOL NEWS RSO-HEW_1-050701D issued on July 1, 2005.

3.2.1 Revisions to Restrictions

1. A limitation has been corrected: To keep quickly pushing the step button on the toolbar switches the source mode of the source window into the disassembly mode.
2. Trace window may not read trace memory image files which was saved in the Trace window.

3.2.2 Functional Extensions

1. The following windows for the real-time OS debugging are added to this version.

   (a) MR Window
   (b) MR Trace Window
   (c) MR Analyze Window
   (d) MR Task Pause Window
   (e) Task Trace Window
   (f) Task Analyze Window

3.3 M16C PC4701 Emulator Debugger V.1.00.01

In this version, the following specifications were changed from the previous version M16C PC4701 Emulator Debugger V.1.00.00.

3.3.1 Revisions to Restrictions

1. A limitation has been corrected: The automatic backup function of workspaces does not operate properly.
   For more details, please refer to RENESAS TOOL NEWS RSO-HEW_1-050216D issued on February 16, 2005.

2. A limitation has been corrected: When connecting with emulator PC7501 or compact emulator in a debugging session of them, High-performance Embedded Workshop might load break points using address match interrupt that are deleted before.

3. A limitation has been corrected: When a setting of RAM monitoring area is changed with RAM Monitor Area Setting window, the setting displayed on-screen may not match with the actual ones, resulting in improper operation.
   For more details, refer to RENESAS TOOL NEWS RSO-M3T-PD308MF-050216D issued on February 16, 2005.

4. A limitation has been corrected: If any of the following operations is performed with the C Watch window being undocked, the High-performance Embedded Workshop abnormally shut down.
   (a) Switching between sessions
   (b) Closing a workspace
   (c) Terminating an application program
   For more details, please refer to RENESAS TOOL NEWS RSO-HEW_2-050301D issued on March 1, 2005.

5. A limitation has been corrected: C watch window may not load correct variable names which are registered in the watch tab.
   This problem occurs if a variable name is entered in any of the following ways:
   (a) An element of an array is specified using [ ] operator.
   Example: a[0]
   (b) A member of a structure or union is specified using . operator.
   Example: str.a
   (c) The destination of a pointer is pointed to using -> operator.
   Example: pstr->a
   (d) An Address or indirection operator (& or *) is used.
   Example: &a or *a

   For more details, please refer to RENESAS TOOL NEWS RSO-HEW_3-050301D issued on March 1, 2005.

6. A limitation has been corrected: The drag and drop operation in memory window may cause the general protection failure.

3.3.2 Functional Extensions

1. Script window is modified to be able to change the display font.
2. The menu to open the online help for the emulator is added.